***भारतीय मानक***

***Indian Standard***

 **IS xxxx : 2024**

 **ISO 11960 : 2020**

**पेट्रोलियम और प्राकृतिक गैस उद्योग — कुओं के लिए आवरण या ट्यूबिंग के रूप में उपयोग के लिए स्टील पाइप**

**Petroleum and Natural Gas Industries — Steel pipes for use as Casing or Tubing for Wells**

ICS 75.180.10, 77.140.75

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भारतीय मानक ब्यूरो

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**November 2024 Price Group**

Steel Tubes, Pipes and Fittings Sectional Committee, MTD 19

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 11960 : 2020 ‘Petroleum and natural gas industries — Steel pipes for use as casing or tubing for wells’ issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendation of the Steel Tubes, Pipes and Fittings Sectional Committee and approval of the Metallurgical Engineering Division Council.

Steel pipes for use as casing are critical tubular components used to stabilize and protect wellbores during drilling operations. These pipes are inserted into the drilled hole to prevent collapse, isolate geological layers, and ensure controlled flow of fluids like oil, gas, or water. Made from high-strength steel, these casings are designed to endure extreme pressures, corrosive environments, and high temperatures encountered in both onshore and offshore drilling.

The text of ISO standard has been approved as suitable for publication as in Indian Standard without deviations. Certain terminologies and conventions are, however, not identical with those used in Indian Standard. Attention is especially drawn to the following:

1. Wherever the words `International Standard’ appear referring to this standard, it should be read as `Indian Standard’.
2. Comma (,) has been used as a decimal marker while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exists. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the edition indicated:

|  |  |  |
| --- | --- | --- |
| *International Standard* | *Corresponding Indian Standard* | *Degree of Equivalence* |
| ISO 80000-1: 2022 Quantities and Units Part 1: General | IS/ISO 80000-1: 2022 Quantities and Units Part 1 General | Identical |
| ISO 643: 2024 Steels — Micrographic determination of the apparent grain size | IS 4748: 2021 Steel - Micrographic determination of the apparent grain size (Third Revision) | Identical |
| ISO 6506-1: 2014 Metallic materials - Brinell hardness test: Part 1 test method | IS 1500 (Part 1): 2019 Metallic materials - Brinell hardness test: Part 1 test method (Fifth Revision) | Identical |
| ISO 6506-2: 2017 Metallic materials -- Brinell hardness test — Part 2: Verification and calibration of testing machines | IS 1500 (Part 2): 2021 Metallic materials — Brinell hardness test —Part 2: Verification and calibration of testing machines | Identical |
| ISO 6508-1: 2023 Metallic materials — Rockwell hardness test Part 1: Test method | IS 1586 (Part 1): 2018 Metallic materials — Rockwell hardness test: Part 1 test method (Fifth Revision) | Identical |
| ISO 6508-2: 2023 Metallic materials — Rockwell hardness test Part 2: Verification and calibration of testing machines and indenters  | IS 1586 (Part 2): 2018 Metallic materials — Rockwell hardness test: Part 2 verification and calibration of testing machines and indenters (Fifth Revision) | Identical |
| ISO 6892-1: 2019 Metallic materials — Tensile testing Part 1: Method of test at room temperature | IS 1608 (Part 1): 2022 Metallic materials — Tensile testing — Part 1: Method of test at room temperature | Identical |
| ISO 7500-1:2018 Metallic materials — Calibration and verification of static uniaxial testing machines Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system | IS 1828 (Part 1): 2022 Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: tension/compression testing machines — Calibration and verification of the force-measuring system | Identical |
| ISO 9513: 2012 Metallic materials — Calibration of extensometer systems used in uniaxial testing | IS 12872: 2021 Metallic Materials — Calibration of Extensometer Systems Used in Uniaxial Testing (Second Revision) | Identical |
| ISO 10893-2: 2011 Non-destructive testing of steel tubes — Part 2: Automated eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections | IS 6398 (Part 2): 2020 Non-destructive testing of steel tubes — Part 2: Automated eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections (Second Revision) | Identical |

The technical committee responsible for the preparation of this standard has reviewed the provisions of following International Standards referred in these adopted standards and decided their acceptability for use in conjunction with this standard.

|  |  |
| --- | --- |
| *International Standard* | *Title* |
| ISO 8501-1: 2007  | Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness |
| ISO 10893-3: 2011 | Non-destructive testing of steel tubes — Part 3: Automated full peripheral flux leakage testing of seamless and welded (except submerged arcwelded) ferromagnetic steel tubes for the detection of longitudinal and/or transverse imperfections |
| ISO 10893-5: 2011 | Non-destructive testing of steel tubes — Part 5: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections |
| ISO 10893-10: 2011 | Non-destructive testing of steel tubes — Part 10: Automated full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transverse imperfections |
| ISO 10893-11: 2011 | Non-destructive testing of steel tubes — Part 11: Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections |
| ISO 11484: 2019 | Steel products — Employer's qualification system for non-destructive testing (NDT) personnel |
| ISO 13678: 2010 | Petroleum and natural gas industries — Evaluation and testing of thread compounds for use with casing, tubing, line pipe and drill stem elements |
| ISO 9712 | Non-destructive testing — Qualification and certification of NDT personnel |
| ANSI/NACE TM0177-2016 | Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H2S Environments |
| API RP 5A3 | Recommended Practice on Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements |
| API TR 5C3 | Technical Report on Equations and Calculations for Casing, Tubing, and Line Pipe Used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing |
| Spec API 5B | Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads |
| ASTM A370 | Standard Test Methods and Definitions for Mechanical Testing of Steel Products |
| ASTM A751 | Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products |
| ASTM A941 | Standard Terminology Relating to Steel, Stainless Steel, Related Alloys and Ferroalloys |
| ASTM B117 | Standard Practice for Operating Salt Spray (Fog) Apparatus |
| ASTM E4 | Standard Practices for Force Verification of Testing Machines |
| ASTM E10-18 | Standard Test Method for Brinell Hardness of Metallic Materials |
| ASTM E18-19 | Standard Test Methods for Rockwell Hardness of Metallic Materials |
| ASTM E23 | Standard Test Methods for Notched Bar Impact Testing of Metallic Materials |
| ASTM E29 | Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications |
| ASTM E83 | Standard Practice for Verification and Classification of Extensometer Systems |
| ASTM E112 | Standard Test Methods for Determining Average Grain Size |
| ASTM E213 | Standard Practice for Ultrasonic Testing of Metal Pipe and Tubing |
| ASTM E273 | Standard Practice for Ultrasonic Testing of the Weld Zone of Welded Pipe and Tubing |
| ASTM E309 | Standard Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation |
| ASTM E543 | Standard Specification for Agencies Performing Nondestructive Testing |
| ASTM E570 | Standard Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products |
| ASTM E709 | Standard Guide for Magnetic Particle Testing |
| ASNT-SNT-TC-1A | Personnel Qualification and Certification in Nondestructive Testin |
| IADC/SPE 11396 | B.A. Dale, M.C. Moyer, T.W. Sampson, A Test Program for the Evaluation of Oilfield Thread Protectors, IADC/SPE Drilling Conference, New Orleans, LA, 20-23 February 1983 |
| MIL-STD-810c | Military Standard: Environmental Test Methods, 10 March 1975 |

This standard also makes a reference to the BIS Certification Marking of the product, details of which are given in National Annex A.

In reporting the result of a test or analysis made in accordance with this standard, is to be rounded off, it shall be done in accordance with IS 2: 2022 ‘Rules for rounding off numerical-values (second revision)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**National Annex A**

*(National Foreword)*

**A-1 BIS CERTIFICATION MARKING**

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.